

Reading file



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street
San Francisco, CA 94105-3901

April 16, 1996

Ron Moore
Carson City District Office
Bureau of Land Management
1535 Hot Springs Road, Suite 300
Carson City, NV 89706-0638

Dear Mr. Moore:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the **Talapoosa Mine Project, Lyon County, Nevada**. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementation Regulations, and Clean Air Act Section 309. We appreciate your granting us a two-week extension on the comment period. As you know, a mishap in mailing resulted in our receiving the DEIS almost a month after it was mailed.

The DEIS analyzes the impacts of alternatives to construct and operate an open-pit gold and silver mine, a heap leach pad, waste rock piles, ore stockpiles, processing and ancillary facilities. The proposed project would disturb approximately 596 acres over a period of seven to ten years.

EPA has rated this project as Environmental Objections-Insufficient Information -- EO-2 (see enclosed "Rating Summary and Follow-Up Action"). Our objections to the proposed project are based on its potential to adversely affect the quality of groundwater and the post-mining pit lake due to the high acid-generation potential of the waste rock and pit walls at this site. We believe that the project's potential impacts to water quality and quantity are seriously underestimated in the DEIS and that additional information is needed in the Final Environmental Impact Statement (FEIS). The FEIS should provide additional information regarding groundwater and HELP modeling, pit water quality, ecological risk assessment, geochemical characterization and waste rock disposal, seepage rates from the waste rock dumps, facilities design and reclamation, and mitigation measures. Our specific comments are enclosed.

We appreciate the opportunity to review this DEIS. Please send a copy of the FEIS to this office when it is officially filed with our Washington, D.C., office. If you have any

questions, please call David Farrel at (415) 744-1584 or Jeanne Geselbracht at (415) 744-1576.

Sincerely,

A handwritten signature in black ink, appearing to read "Deanna M. Wieman", with a horizontal line extending to the right.

Deanna M. Wieman, Director
Office of External Affairs

002426/96-072

Enclosures

cc: Doug Zimmerman, NDEP
John Miesner, Fish and Wildlife Service, Reno
Rory Lamp, NDOW

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION

Environmental Impact of the Action

LQ-Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of environmental quality, public health or welfare. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommend for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1-Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3-Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

Water Quality

EPA is concerned about the potential for acid generation at the proposed mine site. According to the DEIS, the majority of waste rock and pit walls would be acid generating. However, the rock is composed of andesite flows and tuffaceous sediments, neither of which are significantly neutralizing in nature.

According to the hydrologic report ("Talapoosa Project, Evaluation of the Baseline Hydrology and Prediction of Hydrologic Conditions During Operation and Closure," Water Management Consultants, 1995), the prediction of pit lake chemistry is based on the block model that was developed for the waste rock at the Talapoosa site. However, the Lousetown Basalt (Tlb), which was represented as 27 percent of the waste rock in the block model, may not even be present in the pit will at closure (p. 117, Hydrologic Report, vol. 1). In addition, according to the Hydrologic Report, the model shows that the projected buffering capacities of the Lousetown Basalt and Upper Kate Peak formation control the overall pH of the pit lake water. Therefore, if these two formations have little or no presence in the pit walls, this block model appears inappropriate to predict pit geochemistry.

In light of the Lower Kate Peak formation's high acid-generating potential and the questionable buffering capacity of the pit wall rock, it appears that the pit lake could have a much lower pH than predicted. This would also affect the projected concentrations of contaminants in the pit lake. The modeling for pit geochemistry should be conducted using more realistic assumptions, and the FEIS should present the results and conclusions of this modeling. If the pit lake chemistry predictions are revised, the potential ecological impacts and options for mitigation measures would also need to be reassessed in the FEIS.

According to the DEIS, concentrations of several parameters in the Main Pit lake would exceed standards for drinking water, and at least one (arsenic) would also exceed standards for aquatic life and stock water as well. However, no ecological risk assessment has been conducted for the proposed project, and mitigation measures are vague in the DEIS. The DEIS (p. 4-45) states that the Lahontan Reservoir, Carson River, and Carson Sink would present a "more available water source" to wildlife; however, this statement is unclear. The FEIS should identify the anticipated beneficial uses of the post-mining pit lake and provide a more thorough assessment of the risks that it would pose to wildlife. This assessment should also be based on more

realistic pit water modeling conclusions, which we have discussed in our previous comment.

It appears from the DEIS and the hydrogeologic report that the Dyke Adit Pit and East Hill Pit were not included in the original mining plans. The hydrogeologic report does not mention them, and the DEIS does not describe their pre- and post-mining geology and geochemistry or their positions with respect to the projected groundwater contours. It is unclear from the DEIS whether groundwater below these pits would move toward the Main Pit. If not, contaminated meteoric water percolating through the bottom of the pits could degrade groundwater. The FEIS should provide this additional information regarding these two pits.

EPA objects to the project if groundwater would be degraded by subsurface flow of pit water out of any of the pits. This also would appear to conflict with BLM's Nevada Cyanide Management Plan and Nevada Division of Environmental Protection's (NDEP) Regulations Governing Design, Construction, Operation and Closure of Mining Operations (445.24342), which prohibit degradation of groundwater by mining facilities. The FEIS should discuss whether the proposed project would conflict with BLM and NDEP policies and/or regulations and how it would be mitigated to ensure against degradation of groundwater.

Waste Rock Dumps

The DEIS (p. 2-7) states that there is sufficient acid-neutralizing waste rock to buffer any acid generation potential. This statement, however, is unfounded in the DEIS and hydrogeologic report. Elsewhere (p. 4-34), the DEIS states that humidity cell test data from the Upper and Lower Bear Creek horizons of the Lower Kate Peak Formation indicate that aluminum, arsenic, iron, manganese, nickel, sulfate, and total dissolved solids could be produced in leachate. In addition, results of the Meteoric Water Mobility Procedure indicate that most of these parameters, plus lead and zinc, could be mobilized from the waste rock and pit walls. EPA has serious concerns that leachate from the waste rock piles could pose significant threats to groundwater and surface water under acid and non-acid conditions. The majority of waste rock is acid generating, and we believe that the neutralizing capacity of the rock would not be sufficient to prevent acid generation from the waste rock piles.

EPA is extremely concerned that disposal of waste rock would be conducted without any special handling procedures (DEIS, p. 2-7). According to the DEIS (p. 4-35), monitoring of the waste rock pile would be conducted to determine if acid generation is occurring; and, if it is, the waste rock management plan would be

implemented. However, acid generation would not necessarily occur as soon as the waste rock is disposed, and monitoring could, therefore, be misleading. Given the strong potential for acid generation at this site, an appropriate waste rock management plan is essential and should be implemented **as soon as** disposal begins. Neutralizing material should be admixed with acid-generating waste rock in an appropriate ratio during disposal. If sufficient neutralizing potential does not exist in the waste rock, lime or some other neutralizing material should be imported and admixed with the acid-generating rock. The DEIS states that dumping waste rock (which is primarily acid-generating) into the dumps without any special handling "would essentially blend the waste rock to attain the neutralization potential indicated by the mass balance analysis." This conclusion is completely unfounded. Indeed, the lack of waste management at old mine sites throughout North America, which are now generating acid drainage, attests to this.

Significantly more detail is needed in the Waste Rock Characterization and Management (WRCM) Plan and should be included in the FEIS. We have the following recommendations regarding the WRCM Plan:

- The DEIS (p. 4-35) indicates that random samples of dumped rock would be collected and analyzed quarterly to determine acid-generating and acid-neutralizing potentials. The waste rock should be sampled at adequate densities and frequencies for each geologic unit and be characterized chemically and/or visually prior to placement in the dumps. In order to verify visual characterization methods, rock that is classified visually should be tested to confirm its geochemical properties.
- The plan should identify the tests that would be used to characterize the rock and the threshold values that would be used to determine whether rock would be acid-generating and require special handling.
- The DEIS (p. 4-35) states that if acid-generating rock constitutes a significant portion of the dump material, the dump would be situated and designed to reduce infiltration to the extent possible. The DEIS indicates that the majority of the waste rock would be acid-generating, which is indeed significant. The dumps should be designed to reduce infiltration **prior to** commencement of waste rock disposal there so that it is constructed properly from the beginning.
- The DEIS (p. 4-35) generally describes isolation of acid-generating rock within the dumps as well as construction of the dump base and cover. The WRCM Plan and FEIS should include

considerably more detail on construction of the dumps, including thickness and permeability of the base and cover, and the criteria that would be used to determine adequate material for these portions of the dumps.

- The proposed reclamation of the waste rock dumps does not appear to be adequate to preclude meteoric water in order to reduce the potential for acid drainage from the dumps. Rainfall and snow melt will occur in pulses in which evapotranspiration will not be very effective. For example, "most of the infiltration occurs in February and March when the ground is saturated following snow melt, and mean daily temperatures are below 45° F, reducing evapotranspiration" (DEIS, p. E-17). Furthermore, the statement that fines that tend to remain near the top of the dumps would facilitate sealing of each lift surface is misleading. As proposed, the dumps would not be "sealed" to preclude meteoric water. We recommend that the WRCM Plan include specifications for a cap of adequate thickness (at least 18 to 24 inches) with a permeability of no greater 1×10^{-6} cm/sec. An adequate thickness of growth medium would then be placed on top of the cap to promote vegetation.

EPA has reviewed the report, "Talapoosa Project, Use of the HELP Model to Predict Seepage from the Reclaimed Waste Rock Dumps," Water Management Consultants (1995). In general, the most significant error in the HELP model evaluation appears to be the selection of "clay" (soil type #11 in the HELP model) to describe the argillized waste rock. The inappropriate selection of soil type affects several parameters used in the model, including porosity, field capacity, and hydraulic conductivity. The HELP model soil characteristics are based in part on particle size. Therefore, "argillized waste rock" which consists of gravel- to boulder- size rock, regardless of the clay (mineral) content, cannot be considered a clay for purposes of the HELP model. The distinction is clay as hydrous alumino-silicate mineral, or clay as a particle size ($<0.0039\text{mm}$). More specifically:

- The hydrologic report indicates that the degree of argillization increases with depth, but there is no indication of what percentage of the rock is clay. Using a term such as "high clay content" is inappropriate without a quantification of the actual clay content. The information on clay content could be derived from boring logs and soil cores.

- According to Table 4.6 in the HELP model report, the K-value for the waste rock is 0.011 cm/sec, but the K-value for the "argillized waste rock" is 0.000064 cm/sec; a difference of approximately three orders of magnitude.

- The HELP model report (section 4.3.6) indicates that the HELP model predicts a runoff rate of 80-90 percent, with only 10-20 percent infiltration. Again, this is strongly biased by the input soil type. The HELP model should be re-run substituting the input values for the volcanic waste rock rather than the clay description used to identify the argillized waste rock.

In addition, the HELP model report indicates that the "argillized waste rock" would be deposited last on the waste rock dumps and, therefore, comprise a low-permeability cover. However, the DEIS does not mention this, and no description of the available amount or specifications for its placement over the top and side slopes of the dumps (to preclude meteoric water) are provided.

We are concerned regarding the 2:1 slope of the Northeast Waste Rock Dump. According to the DEIS (p. 4-5), reclamation of the steep slopes of the disposal areas is expected to be successful, based on the literature regarding slopes with steepness ratios of less than 3h:1v. It is unclear how successful revegetation would be on the proposed Northeast Waste Rock Dump with a slope of 2:1. The FEIS should provide the success criteria that would be used and contingency measures should success of the original plan fail. We suggest that reducing the volume of this dump be considered so that a final slope of 2.5:1 or shallower can be achieved to improve reclamation.

According to the HELP model report, sandy clay loam would only be used on top of the waste rock dumps, and the slopes would have no cover other than the "argillaceous waste rock." On the Southwest dump, only 53 percent of the dump surface would be covered by sandy clay loam, and on the Northeast dump, only 39 percent of the dump surface would be covered by sandy clay loam. If the "argillaceous waste rock" or any other material used to cap the dump had a low permeability (as assumed in the HELP model), it is unclear that revegetation would be very successful on the side slopes, as the DEIS claims. The FEIS should clarify this discrepancy.

The DEIS (p. 4-3) refers to soil loss on the heap leach facility, which would have slopes of 3h:1v. However, erosion and soil loss for the waste rock piles with slopes of 2.5:1 and 2:1 are not addressed. The FEIS should describe these impacts.

Heap Leach Pad

The FEIS should include additional information regarding the heap leach pad. For example, where will the clay for the sub-base come from and how thick will it be? What are the size and thickness of the gravel that will be placed directly on the

liner? Describe the wick drain. The leach pad will be in a valley and the liner will act as a slide plane. Has a geotechnical stability analysis been conducted, including a seismic analysis? What is the threshold leakage rate that would trigger replacement of a pond liner?

Water Quantity

The estimated pit water volume to be dewatered for the Main Pit, if based only on porosity, appears rather low. It is unclear whether the estimates include fracture flow and how porosity was determined from a pump test (DEIS, p. 3-57). The FEIS should discuss the basis of the assumption that faults will reduce the water flow and, therefore, act as barriers to outside water flow. Some fault or fracture systems create enormous quantities of unexpected water that would not be picked up in a pump test. In addition, the steep topography and potentially high permeability of volcanic rock suggest that there could be flow out of the pit. The FEIS should identify how many pump tests were conducted and where they were conducted, and include a map of locations, pump test results and other parameters associated with test wells. Figure E.3 in the DEIS should include the actual water table in order to make comparisons with the calculated one. The FEIS should also discuss, according to the sensitivity analysis, what permeability for the barrier fault would allow flow out of the pit.

EPA believes that the volume of water that this mine will generate will probably far exceed the conservative estimates provided in the DEIS. The results of the pump test, as discussed in the hydrologic report, indicate potentially extremely variable hydraulic conductivity, which could reflect different recharge conditions in the pit than those predicted. If the pit water volume exceeds the DEIS estimates, several other issues need to be addressed:

- If permeability is higher than projected, the water table around the pit would have a different shape, the pit lake surface elevation would be higher, and the pit would contain a greater volume of water. Mitigation of impacts to water quality and wildlife could be extremely difficult and costly under such conditions.

- If, under steady-state conditions, the pit does not remain a groundwater sink, contaminated pit water would degrade groundwater downgradient of the pit.

- If groundwater pumped during excavation exceeds water needs for mining operations, a National Pollutant Discharge Elimination

System permit would be required in order to discharge to surface waters.

The DEIS indicates that maximum drawdown would occur in 20 years. It is unclear why this would be the case for a project that would only last up to ten years. The FEIS should clarify this.

Mitigation

The DEIS states that a case-by-case analysis of the economic feasibility and impacts of any mitigation plan would need to be developed prior to implementation. EPA believes that such analyses should be conducted **before** approval of the Plan of Operation (POO) to ensure that such mitigation would be feasible and that funds would be available for any necessary measures. EPA believes that the proposed project's impacts to surface and groundwater could be significantly worse than predicted. If mitigation of significant impacts would not be feasible for economic or technical reasons, the project, as proposed, should not be approved.

One measure mentioned in the DEIS (p. 4-42) to mitigate the effects of the contaminated pit lake involves pumping fresh water into the pit to dilute pollutant concentrations. However, an active mitigation measure that would need to be implemented in perpetuity is not acceptable. Another mitigation measure mentioned is diverting site runoff into the pit. It is unclear that the amount of runoff would be adequate to dilute the pit lake, especially in light of the potential that the pit lake would not be as small as the DEIS projects. The FEIS should discuss these possible mitigation measures in more detail.

The DEIS (p. 4-7) discusses measures to create nesting sites for raptors affected by the proposed project. However, these measures would only be effective after mining ceases. The FEIS should discuss the measures to mitigate nesting site losses during operations.

The use of high-density polyethylene balls to exclude birds from solution ponds appears to be an effective deterrent, and we concur with Nevada Division of Wildlife's recommendation regarding their use on the site.

Clean Water Act Section 404

The proposed Southwest Waste Rock Dump would be located over approximately 6,000 linear feet of waters of the U.S. However, the DEIS does not provide baseline information about these waters, such as affected acreage or habitat type. This

information should be provided in the FEIS. The FEIS should also discuss efforts to avoid, minimize, or mitigate the loss of this drainage. We urge BLM to require design of the facility such that the ephemeral drainage is avoided to the extent possible. Where waters of the U.S. cannot be avoided, we recommend that mitigation be required.

Other Comments

Figure 3.7 of the DEIS refers the reader to Figure 3.10 for the location of cross-section A-A'. A-A' is not depicted on Figure 3.10. The FEIS should rectify this. Figure 3.7 should also provide a compass direction and vertical scale.